SaguaroLand

Bulletin of the Desert Botanical Garden, Phoenix, Arizona • Volume 40 • Number 6 • January/February 1987

Construction Update: New Trail Takes Shape

by Ruth Greenhouse

Holiday vacation time gave us a chance to catch our breath and look back on all the work that has been done on the new trail over the past two months. After cacti and native shrubs were salvaged from the areas of the exhibit that were going to be developed, preliminary preparation of the site began. The trail and grassland habitat were cleared and raked. Powerful earthwork machines excavated and shaped the pond and marsh area. The ripper tooth of a D-9 bulldozer broke up rock and softened the earth to prepare it for planting mesquite trees in the mesquite bosque. Backhoes excavated the planting pits needed for mature boxed trees, some in boxes as large as five feet square. Other equipment drilled and pounded the rocky ground to create holes two feet wide by four feet deep for planting saguaros in the desert foothills habitat.

Throughout November the sounds of heavy machinery were heard echoing around the Garden as construction continued. Once they became accustomed to these overpowering sights and sounds in our usually tranquil environment, Garden staff and volunteers began to look forward to the changes and development of the exhibit that these signified.

At the same time these dramatic changes were taking place, small ditchwitch tractors dug the trenches needed for the irrigation and electrical lines. The land was opened and closed, amended and raked, to ready it for the realization of a plan that until now was only a vision and a two-dimensional drawing.

The fruits of all this labor began to come more clearly into focus as the first trees were placed in the ground. Twenty-six mature mesquite trees plus several smaller trees formed the mesquite bosque. Almost fifty tall saguaros were hoisted into place in the desert foothills habitat with a huge crane. A row of blue paloverde and ironwood trees was planted along the northern boundary of the exhibit to screen the service road and Australian exhibit. Fifteen cottonwood trees were planted in the riparian habitat, and trees were also placed in other strategic locations along the trail.

At this time we are fine-tuning and finishing the pond and marsh, planting hundreds of shrubs and completing the irrigation system. We are also gearing up for Phase II of construction which will complete the rest of the exhibit.

1987 Cactus Show February 14-22

The 40th Annual DBG Cactus Show & Sale should be the biggest ever. For the second year, the show will be held in a big-top tent at the Garden. We expect exhibitors to display more than 1,000 entries. Co-sponsored by The Phoenix Gazette and the Central Arizona cactus and Succulent Society, the show has become one of the most important exhibitions of its kind in the southwest.

An entry form is included inside the Bulletin. Additional forms, if needed, are available at the Garden or by calling 941-1225. Completed forms should be received at the Garden no later than February 6.

The preview party and awards reception will be held on Friday evening, February 13 at 6:30 p.m. Members are invited to attend.

Plants similar to those exhibited in the show may be purchased during the Cactus Show. These plants are brought in by the Garden especially for this event. It is the only time that many of these varieties are available in Arizona.

Around the Grounds

Steve Priebe, chief horticulturist; Judy Mielke, Suzanne Nelson and Mary Wilkins horticulturists.

In the spring of this year, the City of Scottsdale agreed to fund a research project at the Desert Botanical Garden. The decision to do this came after much discussion about the actual water requirements of specific landscape plants. The study undertaken this year will help to determine the minimum water requirements of 15 species of plants that are used frequently in valley landscapes.

The research plot is located to the east of the Succulent House between the service road and the Australian Section. Work was begun on the project in late August. At present, all of the planting has been done, the drip irrigation system has been installed, buried and calibrated, and an enclosure (fence) built around the plot to keep out rabbits and other pests. As soon as the plants are established we can begin to collect pertinent data that will tell us how much or how little water is actually needed to maintain these particular species.

You might have noticed that there are some changes taking place in the Succulent House. As of the end of September, the non-succulent *Cycad* and *Jatropha* species have been removed from this area to make room for the addition of new families of succulent plants. The construction of a 3-foot concrete wall on the eastern half of the northern wall is the first step in building a tiered area which will house members of the *Mesembryanthemum* and *Composite* families. In the future we hope to exhibit succulent plants on the basis of their family ties, with each area being set aside for a particular family. New families which we hope to introduce would include: *Amaryllidaceae, Chenopodiaceae, Cochlospermaceae, Leguminosae, Moiraceae, Passifloraceae* and the *Pedaliaceae.*

Another noticeable change in the garden has occurred in the tiered beds outside Dr. Breunig's office. In an attempt to increase the number and diversity of plants from the peninsula of Baja California, as well as to further define the area as a geographic collection, the bed of aloes was relocated to the African Section (the area just west of the Landscape Demonstration Garden that is currently under development). Needless to say, the addition of so many large clumps of blooming aloes has given the African Section a tremendous lift.

The newly cleared Baja beds are already home to several species of plants, a few of which are firsts for the Garden. They include *Viscainoa geniculata,* a shrub related to creosote *(Larrea tridentata), Cochlospermum corindum,* a climbing vine, and the grey, downy-leaved *Salvia apiana.* Be sure to watch for coming attractions such as Queen's wreath vine, *Antigonon leptopus,* a small yellow-flowering shrub, *Cassia purpusii,* and hopefully a white-flowering yucca, *Merremia* sp. (like the yellow vine on the Eliot patio).

The Chihuahuan Bed has undergone some dramatic changes also. In late November seven large saguaros were transferred from there via crane and truck to the new exhibit trail, *Plants and People of the Sonoran Desert.* We are striving to make our geographic collections as intact as possible, so that the Chihuahuan Desert Section gives one the feeling of being in the Chihuahuan Desert, and so on throughout the Garden. Other non-Chihuahuan plants will be transplanted out as appropriate replacement plants become available.

Since Luminaria Night the Horticultural Aides have helped plant over 30 agaves and yuccas. These have been placed along the trail from the gift shop to the first bridge near the Demonstration Garden.

In the vegetable garden, old crops were harvested and replaced with new ones. Recent additions have been spinach, white icicle radishes, red radishes and turnips.

DBG Gets Funding

The Garden has been awarded a grant from a family foundation in Tucson for a 2-year study of rare but useful desert plants from the border states of the U.S. and Mexico. The program, which will be called *Florutil,* will document the status of plants that have contributed to past and present economies and are currently threatened by land clearing, overgrazing, overharvesting and disruption of traditional land and plant management practices. At least 50 of the endangered plant species are close relatives of domesticated crops and offer potential for breeding resistance to drought, heat, pests, disease, salinity and mineral toxicity, yet their gene pools are being rapidly depleted.

This grant will enable the Garden to collaborate with scientists in Mexico on conservation and ethnobotanical studies in their border states. A portion of the funding will be used to build a bilingual data base to guide joint strategies for both *in situ* and *ex situ* conservation. Dr. Gary Nabhan, the DBG's assistant director for research, and Wendy Hodgson, curator of the Herbarium, will be working on the *Florutil* project.

Speakers' Bureau

The Desert Botanical Garden is pleased to offer a speakers' bureau as a new community service. Several staff members are available to give one-hour presentations on a variety of topics. There is a fee of $20 for each lecture. The following topics are available:

- Ecology of the Saguaro
- Edible Plants
- Plants Used in Arizona Indian Baskets
- American Indian Uses of Desert Plants for Food, Fiber and Medicine
- Arid-Landscaping
- Desert Vegetable Gardening
- Wildflowers of Arizona
- Endangered Plant Species/Native Plant Law

For further information or to schedule a speaker, contact the Education Department at 941-1225.

Director's Report

Dear Garden Members:

This January the Desert Botanical Garden begins a year-long celebration of the 50th anniversary of our incorporation. The year 1987 will be a time for reflecting back . . . and looking forward.

Through articles in Saguaroland Bulletin and special events we hope to communicate to our members a clear understanding of how the Garden came to be founded and of the influences that have shaped our growth over the past fifty years. At the close of this year we hope to have a grand celebration as we open our new exhibit, *Plants and People of the Sonoran Desert.*

As we lay the foundations for the next fifty years at the Garden it is most important that we keep the fundamental purposes of the garden in focus. Simply stated, our mission is to create an ever deepening awareness of desert plants and their role in desert ecology. Everything that we do must bring us back to that purpose. The need for an active Desert Botanical Garden is more critical today than ever before.

At the dedication of the Garden, Mrs. Gertrude Webster stated that one of our primary purposes is to "conserve our Arizona desert flora, fast being destroyed." Today we recognize that the very survival of the Sonoran Desert itself is threatened by a variety of human activities.

The Garden has an ever growing responsibility to effectively communicate to our fellow human desert dwellers the beauty, complexity, the fragility and the value of desert lands.

Through active research and education progams we can do our part to help conserve our remaining desert lands and their diverse flora so that future generations may enjoy their beauty, their mystery and the opportunities they provide for solitude.

Robert G. Breunig, Ph.D.
Executive Director

COMPAS Presents "All That Glitters"

Comedy by Phyllis Diller and fashions by Bob Mackie will highlight *All That Glitters,* a black tie affair sponsored by COMPAS to benefit the DBG, the Heard Museum, the Phoenix Art Museum, the Phoenix Symphony and the Phoenix Zoo.

Scheduled for Friday evening, January 30 at the Hyatt Regency at Gainey Ranch, the event will include a silent auction during the cocktail hour. Among the auction items are a group of six nature sculptures donated by sculptor Norbert Roessler, a case of vintage champagne, and a dinner for six at Vincent's. At the fashion show, sponsored by Femina of Scottsdale, Bob Mackie will present a special collection of his spectacular creations. Mackie designs are worn by such celebrities as Cher, Carol Burnett and Elton John. The designer has donated one selection, valued at $3,000, to be offered during a live auction at the end of the evening.

Tickets are $100 per person ($200 for runway seating) and are available through COMPAS. For reservation information call the COMPAS office at 274-1371.

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Director: Robert G. Breunig
Editor: Sondra Mesnik

DBG Photo Show February 14-22

Deserts of the World, the Garden's 10th annual photography exhibition, will be held concurrently with the Cactus Show this year giving members two good reasons to come out to the Garden during the week of February 14-22. This juried show includes black-and-white prints, color prints and color slides. Entries are to use subject matter that conveys the spirit of desert regions, their strangely varied landscapes and unique plant life. The exhibit will be on display in Webster Auditorium from 9 a.m. until 5 p.m. daily.

Members preview and presentation of trophies and ribbons will be held on Thursday, February 12, at 7 p.m.

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Desert Botanical Garden Members — New and Renewals

November and December

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The Battersby Family
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(continued on next page)

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Reminder . . .

Colors of the Desert
January 24 (Saturday)
9 a.m.-noon
Instructor Ron Dinchak will help you plan a color scheme to keep your yard blooming all year round. Advance registration required: Members $8.00, nonmembers $10.00.

Photo Workshop
February 7 (Saturday)
9 a.m.-3 p.m.
Noted photographer Jerry Sieve presents a special nature photography workshop using the Garden as a living laboratory. This is a rare opportunity to learn the techniques used by professionals. Advance registration required: Members $30.00, nonmembers $35.00.

Gift Shop Gets New Name

Our gift shop has a new name: *The Gift Garden*. The winning entry was submitted by Peggy Moshier of Paradise Valley. Her prize is a beautiful decorated basket filled with unusual items from the shop: a hand-cast bronze bell, a colorful saguaro wind sock, a handsome Arizona Highways book, a set of 12 fine prints for framing and a $25.00 gift certificate. We want to thank the hundreds of people who submitted entries for the *Name the Gift Shop Contest*. The judges had a difficult time choosing from the wide variety of suggested names.

Luminaria Night Visitor

A whir, a scuffle, then silence . . . was it a bird or a bat? And what did it think it saw gleaming in the twilight . . . an evening primrose, a yucca blossom or an exciting new flower? Whatever it was, a flying creature startled luminaria lighters when it dove straight into a just-lighted luminaria, extinguished the candle and, after a brief scuffle inside the bag, flew out again. Investigation by DBG research scientists indicates that this is the first episode of "bag pollinating" ever witnessed at the Garden.

Coming Attractions: Mark Your Calendar

Spring Plant Sale
March 14-15 (Saturday and Sunday)
(Members preview: Friday, March 13 3:00-6:00 p.m.

Tour of Valley Gardens
March 29 (Sunday)

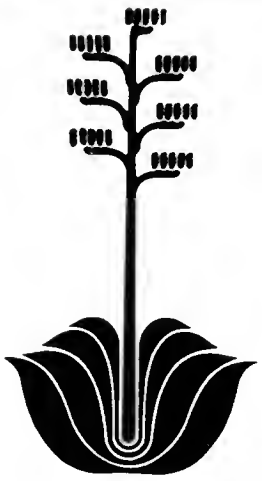
Staff Notes

David Elliott is the Garden's acting maintenance supervisor. He quickly became a seasoned veteran as he got involved with the preparations and logistics of Luminaria Night. When he is not working at the Garden, David enjoys organic gardening, painting and writing poetry.

Linda Trawick has joined the staff as assistant to the director. Linda attended Georgetown University, earned her M.B.A. at the University of Virginia and was involved in Washington in public lands use and environmental issues.

Clayton Newberry has moved from the maintenance department to the collections department. He will be working as assistant propagator and will be directly involved in our programs of plant conservation.

Robert Bell is working part-time at the Garden on the research project funded by the City of Scottsdale described in *Around The Grounds*. Bob has an M.S. in botany from Illinois State University and earned his Ph.D. at ASU.



DESERT BOTANICAL GARDEN

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SaguaroLand

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Gentry Announces Retirement

Dr. Howard S. Gentry, the DBG's distinguished research director, has informed the board of trustees that he plans to retire from the Garden April 1. Gentry is one of the world's leading authorities on agaves and has been a pioneer in basic studies on the practical cultivation of arid land plants as edible or economic crops.

Dr. Gentry's energy, enthusiasm and curiosity belies his 83 years. His idea of retirement includes working at his farm in California, pursuing his interest in developing Sonoran Desert herbs as a commercial crop for desert farmers and working on his autobiography.

Since joining the Garden in 1971 Gentry's work has helped to establish a research program that has earned credibility for the Garden as a scientific institution with a long term commitment to research and the conservation of desert plants.

Plant explorer, research scientist and agave scholar, Dr. Howard S. Gentry will retire from the Garden in April.

Update: New Exhibit Trail

Work on the river marsh habitat is nearly complete and the pond will be filled with water this month. The pond was excavated and shaped, a waterproof lining was installed and the bottom and sides were enhanced to give the appearance of a natural desert stream. Riparian plants like cane, cattail and arrowweed will be salvaged and planted directly in the marsh area. Willow cuttings collected this winter form Lake Pleasant and Salt River Project property are rooting and leafing out and will be planted in late spring.

Garden staff and volunteers, including members of the Arizona Native Plant Society, spent all day Sunday, February 1, planting small cacti, creosote and shrubs in the desert foothills habitat and peeling mesquite limbs for use in ethnoarchitectural structures.

Lots of activity is scheduled to take place in late March and April. We will be planting grassland yuccas, hydroseeding grasses, putting in chaparral plants and moving an archaeological site from State Highway 87 that will be reconstructed on the new trail.

Baja Trip

Dr. Breunig has just returned from Baja California with a group of DBG members. The ten-day land and sea excursion included stops to explore the unique plant life of the area, visit seal rookeries, observe native birds and get a close look at migrating gray whales. Expert naturalist guides made this trip a memorable experience for the DBG group.

The Garden wants to organize more trips for members and we would welcome your comments and suggestions to help us with our planning.

DBG Family Reunion

On January 18 the Garden celebrated a significant milestone, the 50th anniversary of the incorporation of the Arizona Native Flora Society, which was established in 1937 for the purpose of building a "desert botanical garden" in Phoenix. Although the Garden itself did not open to the public until 1939, we marked this occasion by gathering old friends together to share some memories, catch up on each other's news and talk about plans for the future.

Nearly 100 guests met for a reception in the saguaro forest area of our new trail, *Plants and People of the Sonoran Desert,* which is still under construction. Later, after dinner in Webster Auditorium, guests were entertained with reminiscences by Dr. George Lindsay, the Garden's first director, currently director emeritus of the California Academy of Science.

It was a delightful evening shared by current and past trustees, staff, and early volunteers, a time for remembering absent friends and for recounting the Garden's early struggles. As we examine our recent accomplishments and make plans for the future it is important that we continue to recognize the contributions of those who have gone before us.

Wildflower Hotline

Each year it seems we get more requests for information about spring flowering in the desert. Since the first of the year, we have been receiving long distance calls from people in the midwest, the east and the northeast who want to know the "best" time to visit Arizona to see the desert bloom.

On March 1 our Wildflower Hotline went into service for 1987. Updated every Friday, this is a recorded message that reports the current status of wildflower blooms throughout the state. The number to call is 941-2867, and it is in operation seven days a week, 24 hours a day, a community service presented by the Desert Botanical Garden.

Agave #3 *by Dale R. Merrill, was a First Prize winner in the 1987* Deserts of the World *Photography Exhibition.*

Tour of Valley Gardens

This year's tour, scheduled for Sunday, March 29, features four very different approaches to landscaping with drought tolerant plants. All the homes are located in Paradise Valley and each has something unique and special for visitors to enjoy.

Tickets are available in advance through Dillard's Box Office and the Garden's Gift Shop at $8.00 for adults and $5.00 for children 5-12. Sponsored by the volunteer Friends of the Garden, proceeds from this fundraiser will be used to help build the new exhibit trail at the Garden.

DBG To The Rescue

Galvin Parkway is scheduled to be widened at the McDowell Road intersection on or about May 1. A number of major plants in the path of this project were flagged for salvage by the Garden. One of them, a mature saguaro with many arms, was a real challenge to move. Fortunately the effort was successful and it has been added to the 40 or so giants that make up the saguaro forest in the foothills habitat of the new trail.

We also received an unusual crested saguaro from another salvage operation. Visitors to the Garden can see it in its new location between the Cactus House and the Succulent House.

Arid-Zona Entries

May 1 is the deadline for entries in the 1987 Arid-Zona Landscape Competition sponsored by the DBG, Salt River Project and the Arizona Nursery Association.

As part of our commitment to water conservation through the use of drought tolerant plants in residential and commercial landscaping, the Arid-Zona Competition recognizes homeowners, landscape architects and contractors who create attractive and functional landscapes using desert adapted plant materials.

Entry forms and contest rules are available by calling the Garden at 941-1225 or by mail to:

1987 Arid-Zona Landscape Competition,
1201 N. Galvin Parkway
Phoenix, AZ 85008.

1987 Cactus Show

Despite a few days of cold and windy weather the 1987 Cactus Show was a great success. More than a thousand plants were on display in the Show Tent and some 10,000 people visited the Garden during Cactus Show week, admiring the specimen plants on display and making purchases from the selection of cacti and succulents that were available in the plant sale area.

Vikkie Bone was the big winner this year, taking six trophies, two sweepstakes awards, the Phoenix Gazette Award and the Charles & Lillian Mieg Memorial Trophy.

Other trophy winners were Jim & Electra Elliot, Stephen Stempleski, Fred Kaspar, Larry Fischer, Fran Tolleson, Lisa Barton, Jackson Fitz-Randolph, Lou Steichman, Gerald Yates and Greg Starr (novice). Sweepstakes awards also went to Jim & Electra Elliot and Tina Inman.

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Desert Botanical Garden Members — New and Renewals

January and February

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Bulletin of the Desert Botanical Garden, Phoenix, Arizona • Volume 40 • Number 8 • September/October 1987

IMS Awards Grant to DBG

The Garden has received a Conservation Support Grant of $17,200 from the Institute of Museum Services. Conservation grants enable museums to conduct projects such as surveys of environmental and collection conditions, conservation of objects in their collections, training and research in conservation and species survival activities.

The DBG's funding will be used to improve environmental controls in the Succulent House to better maintain our collection and allow us to display a greater variety of succulent species. Mary Wilkins, staff horticulturist, will be devoting half of her time in the next six months to managing this project.

After a year of collecting data on temperature fluctuations within the lath house it became clear that we need greater protection from the catastrophic freezes (according to statistics, such freezes occur ten times in ten years) that could destroy the succulent collection.

We will be putting in covers, portable heaters and misters to moderate the temperature variations. Misters will also help to lower summer nighttime temperatures which stress the Crassulaceae. With improved environmental controls, we will be able to transfer a number of succulent families from the propagation area to the lath house so the exhibit is more representative of the succulent strategies.

Using rockwork and masonry, raised beds will be developed in the display area of the Succulent House. This will create a more attractive visual setting for the plants, and it will also allow more effective management of the succulent collection.

The priority given to this project reflects a commitment by the Garden to renovate and upgrade the core collection as well as developing new exhibit areas.

Dr. Gary Nabhan (left), researcher Luis Hernandez from Mexico, DBG volunteer George Humphreys and horticulturist Suzanne Nelson are experimenting with intercropping, or mixed plantings of desert crops, at the Garden's mini-farm.

Help Wanted: New Volunteers

Fall is just around the corner and it's time to think about getting out and getting involved again.

If you have a few hours a week or a few hours a month that you want to put to productive use, come to our Open House/New Volunteer Coffee on Monday, October 12, at 10:30 a.m. You can meet some of the DBG staff and learn about the many opportunities for volunteering at the Garden.

Docents are needed for our education program (guided tours, demonstrations — especially for our new exhibit trail, *Plants and People of the Sonoran Desert).* Volunteers are also needed as horticulture aides, propagation aides, for the Senior Gardener program and the gift shop. Other areas where help is always welcome are the library, the research department, COMPAS, office administration, community relations and special events.

If you are interested in becoming a volunteer but can't attend the Open House, just call Lynne Bowenkamp, volunteer coordinator, at 941-1225.

Dinner on the Desert

Hey there, podner! Don't circle the wagons, but DO circle your calendar. The date for the 1987 *Dinner on the Desert* is Saturday, October 24. Head for the ol' corral at Tom Chauncey's Barn. There's gonna be good vittles and spirits to wash them down!

Tickets this year are priced at $150 per person or $200 per person for ringside seating. The Desert Botanical Garden earned $85,000 from your support of this event last year and that ain't hay, podner.

So don't miss out on the good times. Let Donna Fleischer, 1987 Chairperson, know we can count on you. She'll see that you get a mighty high-toned invitation to the shindig!

- - - - - - - - - - - - - - - - - - - -

Name _____

Address _____

_____

City State Zip

Mail to: Donna Fleischer
Donna's Plants
7720 E. Redfield, Suite 10
Scottsdale, AZ 85260

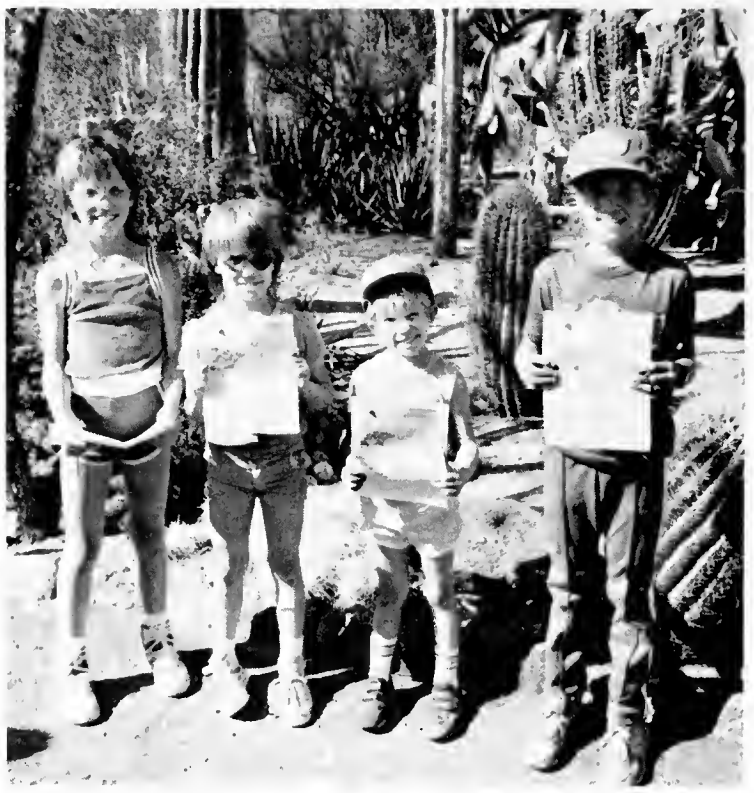
Mott Fund Grant to DBG

A one year, $15,000 grant from the Ruth Mott Fund has been awarded to the Desert Botanical Garden to collaborate with the University of Arizona in the study of intercropping desert plants to reduce agricultural chemical usage.

The goal of this project is to demonstrate ways to reduce water, fertilizer and insecticide application in desert farming. Intercropping low maintenance plants is one strategy for accomplishing this. In addition to several specific experiments, the project includes a public education component with lectures at the Desert Botanical Garden by two nationally recognized researchers in sustainable agriculture.

It is hoped that this project will allow the Garden to serve an additional constituency: farmers in extremely arid areas on both sides of the border.

Mark Slater, biologist and Dr. Cay Randall, entomologist, have joined the DBG staff to help with this program. Dr. Rob Robichaux is coordinating the project for the University of Arizona.



On a visit to the Garden, cousins Nicky, Jamie and Michael Shake and Greg Zeller followed the self-guided tour booklet, The Desert Detective. *Using Sammy Saguaro's clues, each made a perfect score to become* Super Saguaro Sleuths. *Children who visit the Garden this year will all receive a copy of* The Desert Detective *to help challenge their observation skills.*

Water Conservation Demonstration House

The Phoenix City Council and Salt River Project have allocated a total of $30,000 to fund a six-month design project for a proposed *Water Conservation Demonstration House* to be built here at the Garden.

The house itself will be within the price range of the average Valley homeowner and will feature the latest developments in water-saving techniques, with particular emphasis on landscaping as part of this conservation program. The project is being coordinated by the Department of Arid Land Studies at the University of Arizona.

This project is another example of the Garden's commitment to helping people understand that desert plants can be an important element of living in the desert.

News from COMPAS

William H. Mallender, president of COMPAS, announced that a total of $100,000 has been distributed to the five beneficiaries: Desert Botanical Garden, Heard Museum, Phoenix Art Museum, Phoenix Symphony and Phoenix Zoo.

In the past, COMPAS has only awarded funds every other year. Though the COMPAS Eleven format will remain a two-year process, fundraising events will be held every year and monies will be distributed to the beneficiary organizations as they become available.

Since its inception in 1967, COMPAS has raised more than $3.7 million in support of the Valley's arts and sciences.

* * * * *

COMPAS has a display at the Arizona Bank Galleria, 101 North First Avenue, that features Norbert Roessler's sculptures of desert flora, a Woodward Payne watercolor, a Rebecca Clayton oil, a collection of antique knives, oriental prayer rugs and many other items.

The exhibit will run through Thursday, September 10 and conclude that evening with a silent auction and cocktail reception. Bids may be submitted any time during the showing, and sales will conclude at the reception between 6:00 p.m. and 8:00 p.m. Cost to attend the reception is $50.00 per person which may be applied to one purchase.

The event is being sponsored by The Arizona Bank. Proceeds will be distributed to the five COMPAS beneficiaries. For further information and to be included on the mailing list for the reception call the COMPAS office at 274-1371.

Rare Gourd Sought

On a recent trip to Florida, DBG assistant director Gary Nabhan teamed up with Jono Miller of the University of South Florida to search for an extremely rare gourd, *Cucurbita okeechobeensis.* A native of the Lake Okeechobee area of southcentral Florida, this gourd had not been seen since 1981 and there was concern that it had become extinct.

The rare Okeechobee gourd is thought to be associated with pond apple swamps, and the swamps themselves are threatened because of artificially increased water levels in the lake. Nabhan and Miller found and collected a few seeds for propagation experiments. The gourds and most of the seeds were not disturbed.

Okeechobee gourd may be a valuable genetic resource in genetic breeding programs for the genus *Cucurbita,* which also includes pumpkins, squash and gourds as commercial crops.

Excerpts from the Director's Annual Report

This year the Garden is celebrating the fiftieth anniversary of its incorporation. We have taken time to look back upon our proud history and we have remembered the accomplishments of our founders and of those who have contributed in the subsequent fifty years. Today it is equally important that we look forward as we continue to lay the foundations of a new era. I believe that the Garden is on the threshold of becoming one of the most important botanical institutions in our country.

Thanks to broad community support and a grant from the national Endowment of the Humanities, we will soon dedicate a major new Garden attraction, *"Plants and People of the Sonoran Desert."* It will teach us that human cultures need not be estranged from the desert, but can live compatibly with it. I would like to acknowledge the efforts of the entire board and staff on this project. There has been a unified effort throughout to make this project the very best.

The 1984-85 Strategic Plan called for a three pronged research program emphasizing water-conserving landscape plant research, economic botany and plant conservation. The Garden now has active, nationally and internationally recognized efforts in all three domains.

The Garden has become the acknowledged community leader in research and programs that promote the use of attractive, water conserving landscapes. Last June the City of Scottsdale awarded the Garden a three year grant to study the specific watering requirements of selected exotic and native plants.

We are called upon, on a daily basis, to provide information and assistance to our metropolitan community on drought tolerant plants. Our most recent issue of *Agave* magazine, underwritten in part by the City of Phoenix, is continuing evidence of our leadership in this area.

In economic botany we have an active program today, thanks to the efforts of Dr. Howard Gentry, who literally broke ground on the research farm, and Dr. Gary Nabhan who has continued the program. We recently started a new project called the "Arid-Zone Economic Botany Conservation Program," collecting and evaluating germ plasm of wild desert species with high economic or nutritional value in order to study their adaptability and tolerance to low irrigation techniques. Desert research colleagues and students from Mexico are participating in this effort in international cooperation which will provide the basis for the widespread application of the concepts developed at the Garden.

We are also continuing our conservation program with projects funded by the Center for Plant Conservation, Office of Endangered Species and the Lindley Foundation. Our goal is to develop a major program over the next several years that combines critically needed research in conservation biology with economic botany.

It is critical that in the coming year we continue our capital momentum by upgrading our basic infrastructure and restoring our existing facilities. This means installing or drilling a new water line to provide adequate water pressure, and major electrical and structural repairs for Webster Auditorium.

All of this work, however, should be done in the context of an updated Master Plan which clearly spells out where new facilities, roads and structures should be located. We must provide a vision for the future that will demonstrate how to live in a desert environment through the integration of desert landscaping concepts and powerful, but appropriate, water and energy-saving desert architecture. Done well, this could serve as a model and beacon to our community. The new facility would house a major introductory exhibit, The Gift Garden, a restaurant, auditorium, classrooms and office spaces. It would immediately communicate the spirit and quality of our institution and serve, along with Webster Auditorium, as an appropriate symbol of the Garden.

Over the past several years we have made significant strides to improve the quality of the Garden's education, public relations and horticulture programs.

Our education program now has strong interpretive emphasis dealing with the adaptive survival strategies of plants, animals and people in desert environments. This unifying theme has helped us structure a coherent education program built upon concepts rather than isolated new areas of the Garden. These themes will be woven into the structure of new exhibit areas and into old exhibit areas that need to be reworked.

A critical need for our educational effort is attractive signage that takes the visitor through the Garden on a conceptual tour and which leaves them with a clear understanding of the Garden's message.

Our public relations program has been outstanding this past year. The Garden is regularly the subject of feature articles in our local papers, and readers of the Republic's Sun Living section are stimulated by the Garden's weekly column on desert plants. Our personal membership program continues to grow and we have exceeded our target goal of an annual ten percent increase. This year it is up 26 percent. We have a long way to go, however, to meet our corporate membership goals.

The horticulture department is continually working to improve our botanical display. A key element in this improvement has been the effort to clarify the interpretative and display purpose of each section of the Garden.

As the Garden develops, our need for more sources of income increases. There has been a constant growth in earned income with admissions and gift shop sales. We do, however, need to solicit more annual contributions for basic operating support. The Garden's financial foundations must be strong before we add new facilities and programming, and this will require a more assured source of operating support from the private and corporate sector.

As we enter our second half-century, I hope that we can continue to pursue the Garden's original goals by defining clear objectives and then following through on them. We have set an ambitious agenda to make this Garden ever greater so that by the end of the century our Garden will be among the premier scientific and educational institutions in the world — to continue to be, as Mrs. Webster hoped, a "compelling attraction," a "scientific laboratory for the study of desert plants" and a place "to conserve our rare plants which are fast being destroyed.

Dr. Robert G. Breunig
May 21, 1987

Chief horticulturist Steve Priebe remembers to "serve from the right and take away from the left." An elegant breakfast was prepared and served by DBG horticulturists to all their volunteer "hort aides" to thank them for their support this past year.

Roadwork Affects Garden Visitors

Construction at the intersection of McDowell Road and Galvin Parkway began on July 27 and is expected to continue through mid-November.

You can expect traffic delays if you are using 64th Street southbound or McDowell Road heading east or west, particularly during rush hours. You can avoid this intersection by taking Van Buren to Galvin Parkway and driving north to enter the Garden.

This road construction is the first phase of the project that will eventually widen Galvin Parkway to two lanes in each direction.

DBG Plans for the Future

In July, the Board of Trustees selected the architectural firm of Vernon Swaback Associates to update and develop objectives for the Garden's master plan.

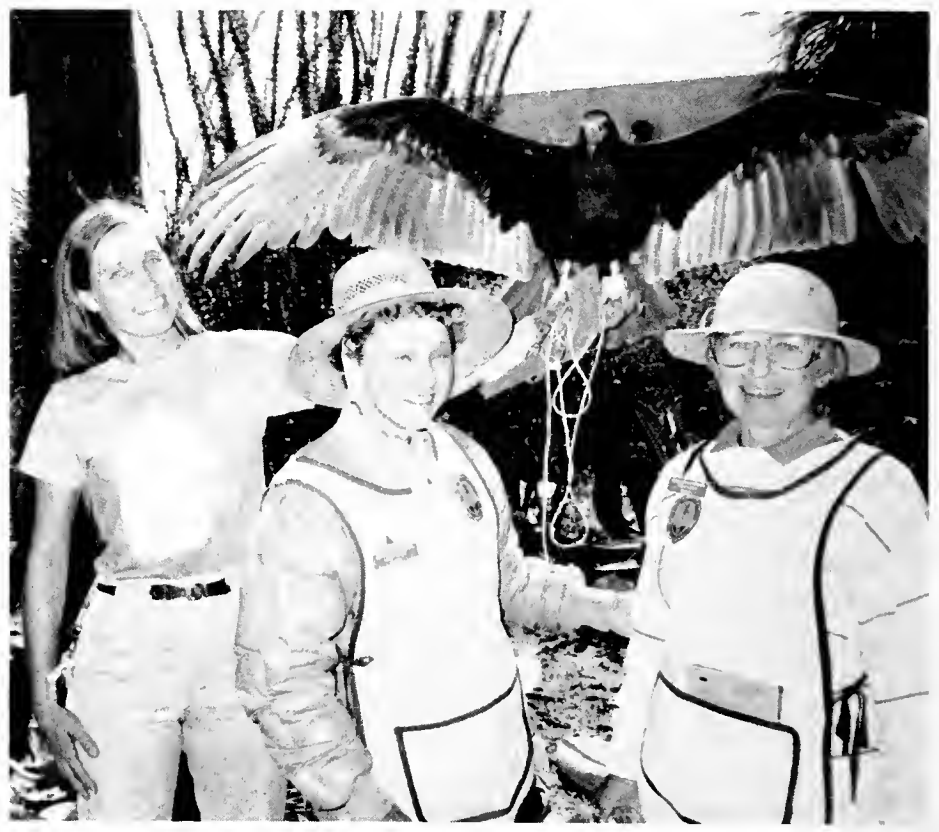
Over the next six months, with input from the Garden staff, we will be finalizing a program that will include plans for restoring Webster Auditorium, improving and expanding the display area of the Garden and creating a design for a major visitor center complex.

We will keep our members advised of our progress during this process. If the results of our planning program are successful, the Garden will be able to expand to meet the ever increasing demands of our community.

Mark Rheinlander looks on as son Josh and daughter Rachel dress a scarecrow. Volunteer Pat Ebbert lends a helping hand. The children were visiting their grandmother, volunteer Nancy Rheinlander, and pitched in to help DBG staff and volunteers as they made eight scarecrows to keep birds and varmints from damaging the plantings at the minifarm.

New at the Gift Garden

Make it a point to stop by *The Gift Garden* to see the exciting new handcrafted jewelry from the Susan Shaw Collection. The artist has captured the essence of the Southwest in her colorful designs by using red and green chili peppers, cactus, birds and terra cotta pots in these unique necklace, earring and bola tie designs. Made entirely by hand, these are genuine conversation pieces. Priced from $8.00 to $26.00. Don't forget members receive a 10 percent discount on purchases at *The Gift Garden*.



During a presentation by the Liberty Wildlife Foundation, Cathy Rickabaugh introduced a turkey vulture to DBG docents Lynn Vogel and Tillie Chew, who lead the Monday morning birdwatching tours at the Garden.

50th Anniversary DBG Postal Covers

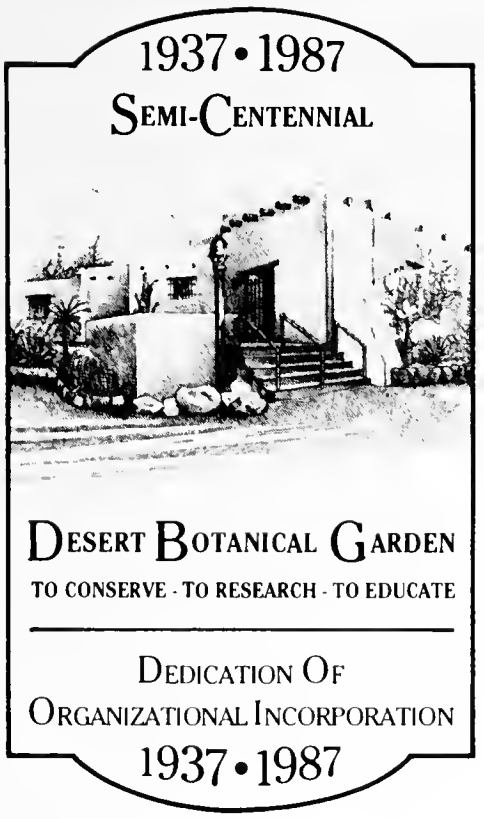
A limited number of DBG 50th anniversary sourvenir cacheted covers franked with Desert Plant Stamps of 1981 and canceled at the U.S. Post office are available at the Gift Shop. Prepared by the Arizona Society of Topical Philatelists, the covers are $1.50 each or $5.00 for a set of four covers (all four stamps represented).

January 2, 1987: Actual 50th anniversary of the dedication. Cachet features Webster Auditorium and is worded *Dedication of Organizational Incorporation.* Circular cancel (non-pictorial) from Phoenix Cactus Station.

February 14, 1987: 50th anniversary cachet as above; pictorial cancel featuring the Garden's agave logo, Cactus Station.

December 11, 1981: First Day of Issue (FDOI) cancel of Desert Plant stamps at Tucson, Arizona. Cachet featuring the four desert plants as photographed in the Garden, prepared by the Arizona Society of Topical Philatelists (ASTP). Inquire for unofficial first-day cancels.

Assortment: mixture of covers in sets of four with all four stamps and both pictorial cancels represented. Cachets with either ASTP plant photos or Webster Auditorium with the following wordings: *Dedication of Organizational Incorporation; 40th Annual Cactus Show, February 1987;* (both with agave logo cancel); and C.S.S.A. (Cactus & Succulent Society of America) Convention, June 1987 (with saguaro pictorial cancel, June 23, Cactus Station) and/or one First Day of Issue cover. Single covers as desired if limited stock is available.



A limited number of commemorative postal cachets and covers are available through the Desert Botanical Garden.

These items may be purchased at the Gift Shop or by mail order to: Desert Botanical Garden, 1201 N. Galvin Pkwy., Phoenix, AZ 85008. Enclose check or money order payable to the Desert Botanical Garden along with a self-addressed, stamped large (#10) envelope. Please list alternate choices since the supply is limited.

The Cost of Extinction

The potential costs of today's accelerating loss of species are large. The sustainability of our basic food crops depends on periodic cross-breeding with closely related wild plants; yet many of those wild relatives are disappearing quickly, like the isolated perennial corn population recently discovered in Mexico. Already, 25 percent or more of our prescription medicines come from chemical compounds discovered in nature, yet we destroy the living repositories of tomorrow's medical discoveries faster than we can explore their chemical properties.

Recent progress in genetic engineering offers the prospect of still further advances valuable to medicine, agriculture and industry. These advances depend upon a continued storehouse of genetic variation in nature. Preventing unnecessary extinction is not just a matter of aesthetic or ethical concern; it is of vital concern to human welfare now and in the future.

From the Endangered Species Reauthorization Act Bulletin

Saguaroland Bulletin
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Editor: Sondra Mesnik

Potpourri • Potpourri • Potpourri • Potpourri

Library Request

We have received a request for a copy of: *Rio Mayo Plants: a study of the flora and vegetation of the valley of the Rio Mayo, Sonora,* by Howard Scott Gentry, Carnegie Institution of Washington, Washington, D.C., 1942, 328 pp. If you know of any copies that are available for purchase or donation, please contact C. G. Barber, Librarian, The Arizona Collection, Tucson Public Library, P.O. Box 27470, Tucson, AZ 85726 (602) 791-4393.

Help Wanted

Even though the Valley is still in the midst of the summer doldrums, a few hardy souls at the DBG are thinking winter.

December 4 and 5 are the dates for this year's Luminaria events, and helpers are needed in every department: making decorations, filling and setting out luminarias, parking cars, baking cookies, walking the paths, serving coffee, to setting up before and cleaning up after.

If you want to be involved, and we're hoping you do, call Lynne Bowenkamp in the Volunteer Office. She'll match you up with just the job you're looking for.

Freezer Wanted

If you happen to have (or know someone who has) a freezer in good working condition that is no longer needed, the Garden would love to have one. We need space to store food items for the ethnobotany trail demonstrations on a year round basis. We can also use it to store cookies for Luminaria. Call Ruth Greenhouse or Lynne Bowenkamp at the Garden (941-1225).

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SaguaroLand

Bulletin of the Desert Botanical Garden, Phoenix Arizona • Volume 41 • Number 9 • January/February 1988

New Trail Opens for Members March 19

After nearly two years of fundraising and construction, the official dedication and opening of the Garden's exciting new exhibit, "Plants and People of the Sonoran Desert," will take place on Sunday, March 20. A special members preview is scheduled for Saturday, March 19, from 3 p.m. to 5 p.m.

Only the finishing touches remain undone, such as fabricating and installing the educational signs, paving the paths and putting in benches along the trail. We hope you will mark your calendar now and save this important date. Watch for your invitation — a special version of our *Agave* magazine — in the mail by March 1.

Reeds and cattails have become well-established in the desert oasis habitat. Willows and cottonwoods have been planted in this area of our new ethnobotany exhibit.

Authentic replicas of historic structures such as this Pima roundhouse offer opportunities to demonstrate how native plants were used by desert dwellers as part of the "Plants and People of the Sonoran Desert" experience.

"Golden Rock Club & Cafe" An exciting New COMPAS Event

A highlight of the 1988 COMPAS campaign is the March 26 "Golden Rock Club & Cafe," gala event in two acts. The "Cafe" will be held at the Phoenix Zoo from 7:30 p.m. to 10:30 p.m., and will feature a Silent Auction, cocktails and a cocktail buffet. The unique setting for the "Club" is an America West Hangar, dressed to the nines for the occasion. Cocktails, hors d'oeuvres, entertainment and a Silent Auction are featured from 6:00 to 7:30 with an elegant dinner and Live Auction from 7:30 to 11:00.

At 10:30, "Cafe" guests will drive to the America West Hangar to join the other group for entertainment, dancing, casino and breakfast. The festivities will last until 2:00 a.m. Tickets are $200 per couple for the "Cafe" and $450 per couple for the "Club."

If you'd like to attend but don't care to go alone, we can arrange for you to be seated with other Garden members. Just call the Garden office at 941-1225 and one of our table hostesses will contact you.

Remember, COMPAS (Combined Metropolitan Phoenix Arts & Sciences) provides major capital funding for the Desert Botanical Garden, the Heard Museum, the Phoenix Art Museum, the Phoenix Symphony and the Phoenix Zoo.

GAP Farm at DBG Breaks New Ground

By Mark Slater

Viewed from McDowell Road or from the Crosscut Canal, the most striking feature of the Gentry Agroecology Project is probably the scarecrows. We often hear passersby call out, "Look at the scarecrows!"

Although the role of the scarecrow is important, I'd much rather hear someone say, "Look, they're growing an intercrop" or "Wow, look at the diversity of crops in that field!"

Realistically, though, it is highly unlikely that we will hear such a comment, especially considering the current public perceptions of desert agriculture. The Gentry Agroecology Project, called the GAP farm by Garden staff, doesn't look at all like the more familiar stands of cotton or citrus. In this article, and in future updates on our work at the farm, we hope to make you aware of how our experiments here offer new options for desert agriculture.

Indian fig prickly pear, Opunta ficus-indica, *is an important food crop in Mexico.*

The GAP farm is a scientific research project dedicated to developing economical and ecological methods of agriculture for small scale farms in the arid Southwest and adjacent Mexico. Our guidelines include:

1. Growing plants that are native to the Sonoran and Chihuahuan Deserts. (We do have a few exceptions.)
2. Using cultivation techniques and strategies that require minimal amounts of water and little or no inputs of chemical fertilizer and pesticides.
3. Monitoring and analyzing these methods and strategies using techniques from both the agricultural and ecological sciences, hence the term *agroecology.*
4. Sharing our experiences and results with interested people, especially small farmers and researchers in these deserts.

A few people have questioned our objective of using only plants of the Sonoran and Chihuahuan Deserts. There are plants from other arid regions that could fit our other goals. My best response is that we are now growing and evaluating more than 50 species of plants at the GAP. Each of these species has an agronomic potential, either as food, cash crop, wood or medicine. We are overwhelmed with the value of these native plants alone — there appears to be no need to add plants from other regions.

In addition, plants from the areas where farmers and researchers are working are easiest to locate and to propagate. Furthermore, the available genetic diversity — important for the plants' adaptability — is higher, and as yet unexploited, with native plants. Exotic crops are often introduced with a narrow genetic base. The ability of plants to adapt to adverse conditions without using chemical fertilizers or pesticides is particularly important in our State of Arizona where chemical applications are well above normal.

Throughout the 1970s, Arizona farmers used twice the amount of fertilizer, four times the amount of pesticides, and incurred twice the irrigation costs as those for the average American farm. These figures are not surprising when you consider that none of the major crops grown in Arizona are desert-adapted. They are dependent on large quantities of water and are grown in large monocultures. Monocultures are generally very susceptible to pests and diseases.

Although desert-adapted plants use less water, it is likely that when grown in monocultures they, too, will be more susceptible to pests and diseases, requiring the use of more chemicals. To address this problem, we are employing strategies that have proven effective in controlling pests in other agroecosystems and using methods that mimic the natural desert environment where pests are not a problem.

Intercropping — growing two or more plants at the same time on the same plot of land — is one such method. If the plants chosen complement each other, i.e., using water or nutrients more efficiently or reducing insect damage, the intercropped plants will produce more food on the same amount of land than their monoculture counterparts.

In late summer and early fall of 1987, we designed an experiment to test the inter-

(continued on page 5)

From the Director

All of us at the Garden wish to thank our members for their generous response to our 1987 year-end appeal. Your contributions. which totalled more than $12,000, plus a grant of $12,500 from Friends of the Garden, have moved us much closer to completing our funding for the trail.

To encourage additional donations, two long-term supporters of the Garden have pledged challenge grants of $5,000 each. Every dollar specifically contributed to *Plants and People of the Sonoran Desert* after January 5, 1988, will be matched with another dollar by these anonymous donors, up to a total of $10,000.

If you have not yet contributed to this project, here is the perfect opportunity to do so. No donation is too small, and every dollar will count for two. I hope all of our members will share in this important effort for the Garden.

On December 14, 1987, the Desert Botanical Garden lost a long-time friend and trustee. Vikkie Bone was a strong supporter of the Garden. Over the years she contributed thousands of hours of her time to a wide variety of projects. Beginning in 1983 she served as an active member of the Board of Trustees. A grower of beautiful specimen plants, Vikkie took many honors at the Garden's Cactus Show over the past several years, including the top prize, the Phoenix Gazette Award, for the past two years.

Vikkie was at the Garden nearly every day during the last several years of her life and, despite a painful illness, she rolled up her sleeves and went to work. Wherever she saw a need she quietly pledged her support, and she was a generous financial contributor to various projects and programs.

Vikkie Bone's dedication and support will be deeply missed by everyone at the Desert Botanical Garden.

Robert G. Bruenig, Ph.D.
Executive Director

Plant sale dates: March 19-20; members preview March 18, 3-6 p.m.

Spring Plant Sale Donations

Plants and cuttings for the plant sale will be accepted on Saturday, March 12, from 8 a.m. until noon at the sales lath house. We can only accept plants that are in good condition and can be identified. Sorry, Donations cannot be accepted at any other time.

Luminaria Post Script

We want to express our appreciation to the Garden members who volunteered their time and energy to help with the 1987 Luminaria events. Without their asistance it would have been difficult to staff an event of this magnitude. Thank you for helping with this very special Garden activity.

Pat Ebbert, Chairman
Lu Gaetje, Co-Chairman

"Please Touch" Carts a Hit with Visitors

Docents are attracting crowds these days at "touch carts" on the trail with demonstrations that teach visitors about the adaptations and uses of desert plants. People especially enjoy handling the items and tasting prickly-pear jelly, prickly-pear punch, nopalitos and mesquite tea. Come see for yourself — "touch carts" are out on the trail Monday through Friday from 10 a.m. until 3 p.m. Bring a friend — it will make you proud to be a DBG member!

Hotel Saguaro at the DBG

A grant from Valley National Bank has made it possible for the Garden to provide an innovative outreach program for Valley schoolchildren. "The Hotel Saguaro," developed in cooperation with The Great Arizona Puppet Theater, is an original production designed to give young children an appreciation and understanding of the desert environment in which we live.

Scheduled through the Garden's education department, "The Hotel Saguaro" travels to schools throughout the Phoenix metropolitan area. A performance is also presented at the Garden one Sunday each month at 2:00 p.m.

Through song and story, the delightful plant and animal puppet characters show how they depend on each other for survival as each of their relationships to the saguaro is explained. The audience begins to understand that the saguaro provides shelter and food for many birds and animals, hence the name "Hotel Saguaro."

How saguaros can be affected by human activities in the desert is also explored. The performance ends with the birth of a baby owl in one of the nesting holes, presenting the positive message that "The Hotel Saguaro" is again open for business.

The half-hour performance is followed by an activity period presented by the Garden's education department. Children will be shown items that come from a saguaro: the sturdy wood of saguaro ribs, roots, seeds, fruit, a "boot" and a real "baby" saguaro that is three years old.

We appreciate the support of Valley National Bank for this innovative program, and we hope our members will bring their children or grandchildren to enjoy "The Hotel Saguaro" at the Garden on March 6 and April 10.

News from the Succulent House

Based on general observations in the past and the condition of the plants, we were concerned that the temperatures in this lath house did not meet the desired parameters for this collection.

For the past nine months we have carefully charted temperature readings in different locations with in the Succulent House. Thse records indicate that the current environment will not protect the plants form the periodic catastrophic freezes that occur in the Valley. (Statistically, these occur every nine years).

Under these conditions, we cannot successfully exhibit many of the plant families that have succulence as a characteristic. Of these 50 or so families, we now exhibit 10 or 12. With conditions improved enough to prevent freezes, we could introduce 20 other families, excluding those too tropical to do well in our arid climate. We could then show the variations and diversity of plants that use succulence as a means of dealing with arid conditions.

Temperature readings in the succulent house indicate that the coldest area is along the north wall. In winter months, the excess shade provided by the lath reduces the amount of daytime heat reaching the ground and minimizes the potential re-radiation of that heat.

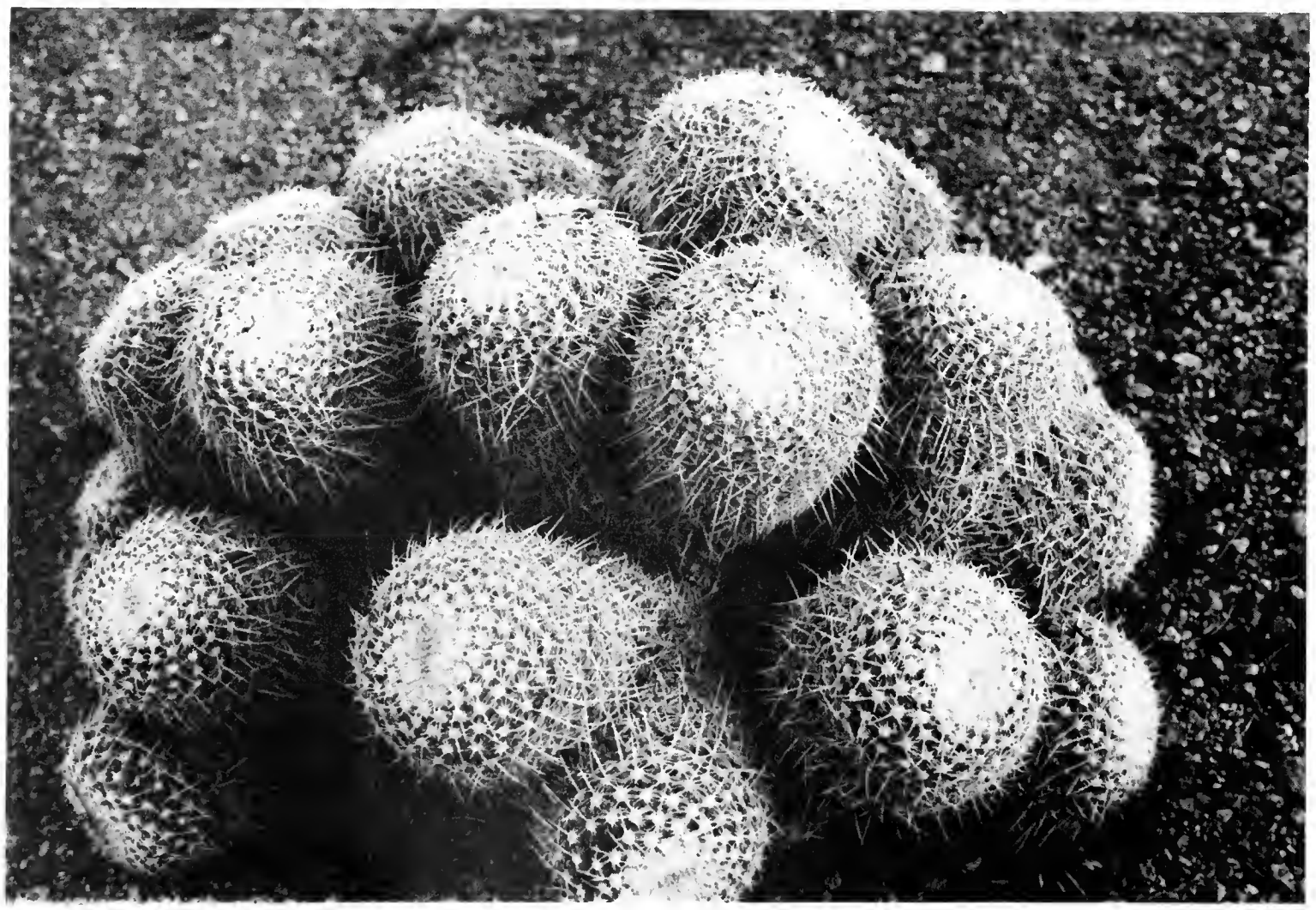
We described these conditions and our plans to correct them in a grant request to the Institute for Museum Services, and our proposal was funded in the amount of $17,000.

With these funds we have acquired a weather radio to accurately monitor conditions according to the National Weather Service so we can be prepared to protect our plants when necessary. We also purchased butane tanks with portable infra-red heaters, which we can place in areas with the most susceptible plants. To protect the north side, we have built up a concrete wall to a height of three feet and are raising up the planting beds to create a thermal mass to protect the plants.

We have also installed a micro-mist system over the Crassulae bed to give these plants some relief from excessively high nighttime temperatures in summer. Succulent plants, which carry out their photosynthesis by a method called CAM (Crassulacean Acid Metabolism), open their stomates at night. In this way, less water is lost through transpiration. They store carbon dioxide in the form of an acid. Then, during the daylight, photosynthesis takes place, using the stored carbon dioxide. High nighttime temperatures inhibit the CAM plants from carrying on their specialized metabolism, and we hope the mist system will hold these temperatures down.

An arrangement of shade cloth mounted on rollers will give us the means to provide seasonal shade in summer for plants that need this extra protection. Retracting the shade cloth in winter will permit the sun to warm the area during the day.

As of this writing, the wall construction is finished, the shade mechanism is being fabricated, and we are in the process of designing the arrangement of the new planting beds. We expect this work to be completed this summer. Among the new plants we hope to add to the collection at that time are succulent members of these families: Cucurbitacea, Moraceae, Passifloraceae, Bombaceae, Pedaliacea, Labietae, Dioscoraceae, Didiereaceae and Compositae.



The Garden's 41st Annual Cactus Show will be held on March 2 through 6, from 9 a.m. until 5 p.m. The Awards Reception and Members Preview is scheduled for Tuesday evening, March 1 at 7:30 p.m.

DBG Sponsors 10-Day Baja Trip April 3-11

Once again we are pleased to be able to offer Garden members a unique adventure trip, first by sea from San Diego to Laguna San Ignacio, then overland across the Vizcaino and Central Deserts.

On the sea portion of the trip the group will visit Isla San Martin for close observation of harbor seals and sea lions, climb to the volcanic crater and study desert plants. The following day we will see Islas San Benito, breeding grounds for elephant seals and California sea lions. Shore parties will investigate the unusual geology and plant life, explore tidepools, visit pinniped rookeries and hike to the picturesque old lighthouse.

Next it's on to Laguna San Ignacio for two days to anchor in the lagoon and watch the California gray whales. Skiff parties can unobtrusively approach the whales for close observation. Shore activities here include birdwatching and exploring the mangrove swamps and the dunes to study the plant life of the area.

At mid-day, guests will transfer to a base camp on the shore of the lagoon for lunch before boarding comfortable vehicles to begin the journey into the desert at a leisurely pace, with our first overnight stop at the secluded old mission village of San Ignacio. The next day, the expedition heads out across the flat Vizcaino Desert with its unique plant communities. By mid-morning the road quickly climbs to an elevation of 3,500 feet in the Sierra San Francisco which offers yet another fascinating look at desert vegetation and distant vistas that include Laguna San Ignacio and the Pacific Ocean.

The journey continues into the Central Desert, home of the huge cardon cactus and the 60-foot Boojum, Baja's most unusual plant. Along the way there are opportunities to explore remote Indian caves, an abandoned onyx mine and an unused rancho. All the while we will share a focus on the unique landscape and its changing plant life with plenty of time for walks in the desert, birdwatching and photography.

Finally, leaving the Boojums behind, we will continue through agricultural regions and increasing civilization, passing through coastal mountains until arriving at the city of Ensenada to spend the night at a seaside resort before our return journey to San Diego.

Participants will enjoy comfortable accommodations aboard the 78-foot *H & M Tradition,* hotel comfort on land, delicious meals morning and evening and delightful daytime picnics, plus travel adventures and exploration every day with expert naturalist guides.

Our Desert Botanical Garden group will also be escorted by Dr. Gary Nabhan, Assistant Director of the Desert Botanical Garden. A well-known naturalist and ethnobotanist, Dr. Nabhan is also the author of two best-selling nature books, "The Desert Smells Like Rain" and "Gathering the Desert."

The cost of the 10-day "Best of Both Worlds" adventure is $1,700. If you wish to receive additional information about this exciting tour, please call the Garden at 941-1225.

GAP Farm *(continued)*

crop strategy. We planted grain millet and tepary beans, both extremely drought tolerant crops, in an intercrop and in monoculture. Our results show that the tepary beans yielded a significantly greater amount of seed in the monoculture than in the intercrop, where competition for light and water by dense millet plantings was too intense. However, the millet yields in the intercrop appear to be greater than in monoculture. Next season we will change the design by alternating rows of the grains and beans or by increasing the within-row spacing.

Another natural strategy that we are testing is the use of "nurse plants" to shelter other plants that are sensitive to the harsher environment away from the nurse plant. In agriculture, this is called o*vercropping*. Not only does the nurse plant provide a suitable habitat for the desired crop, it may also be a source of wood, fruit or other useful products.

We are testing the overcroping strategy by using chiltepins as our sensitive, desired crop. We have planted them in three conditions: one beneath a hackberry tree; one beneath artificial shade; and one in the open. These established plantings are now being evaluated.

Habitat manipulation is also a promising technique to control unwanted pests and attract beneficial organisms. Scarecrows, selective weeding, trap crops, brush piles and physical removal are some of the ways to change a habitat. One of the most exciting manipulations we are planning for this season is the introduction of birdhouses. We hope these birdhouses will attract flycatchers which will feed on insects, thus reducing our pest populations.

In order to monitor the effectiveness of these manipulations, we will begin a bird and mammal census and continue to sample the insect fauna. An adjacent unfarmed area will also be sampled so that we can compare the manipulated area to an untouched area.

One of the projects we most enjoy showing to visitors is our water harvesting system. An arroyo cuts across the northern part of the GAP farm, carrying large amounts of water during heavy rains. A diversion system was constructed to capture the excess water. Through a series of check dams and diversions, the water flows out of the arroyo into catchments surrounding our planted trees. This captured water provids a source of much-needed moisture that otherwise would have simply rushed by and been lost.

However, the real highlight of our work is sharing the results and experiences with other people. In early October, the Desert Botanical Garden sponsored an intensive course on Agroforestry and Polyculture Strategies for Conserving Biotic Resources in Arid and Semi-Arid Zones. Twenty-four participants from both sides of the U.S./Mexico border shared ideas, methods and strategies concerning appropriate desert agriculture.

It is here, through cooperation with other researchers and farmers, and in synchrony with the natural environment, that a new desert agriculture will emerge.

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